

CLAIMS

1. A method of determining an interference relationship between cells of a cellular communication system comprising at least a first cell and a second cell; the method comprising the step of:
determining an interference relationship between the first cell and the second cell in response to a potential interference relationship between the first and the second cell and a simultaneous occupancy of the first cell and the second cell.
- 10 2. A method as claimed in claim 1 further comprising the steps of:
dividing an evaluation interval into sub-intervals;
for each sub-interval determining a sub-interval potential interference in response to the interference characteristics in each sub-interval; and
15 determining the potential interference relationship for the evaluation interval in response to the sub-interval potential interferences.
3. A method as claimed in claim 1 wherein the step of determining a simultaneous occupancy comprises the steps of:
20 dividing an evaluation interval into sub-intervals;
for each sub-interval, determining a sub-interval simultaneous occupancy by determining an occupancy of each of the first cell and the second cell; and
determining the simultaneous occupancy for the evaluation interval in
25 response to the sub-interval simultaneous occupancies.
4. A method as claimed in claim 1 further comprising the step of
dividing an evaluation interval into a plurality of sub-intervals;
for each sub interval performing the steps of:

determining a sub-interval simultaneous occupancy by determining an occupancy of each of the first cell and the second cell,

5 determining a sub-interval potential interference in response to the interference characteristics in each sub-interval, and

determining a sub-interval interference relationship in response to the sub-interval simultaneous occupancies and the sub-interval potential interferences; and

10 wherein the interference relationship is determined in response to the sub-interval interference relationships.

5. A method as claimed in claim 3 or 4 wherein the step of determining the simultaneous occupancy for the evaluation interval comprises determining 15 the simultaneous occupancy as an average of the sub-interval simultaneous occupancies

6. A method as claimed in claim 3 to 5 wherein the occupancy of at least one of the first cell and the second cell is determined from network statistics. 20

7. A method as claimed in claim 6 wherein the network statistics comprise a measurement report quantity characteristic.

8. A method as claimed in any of the previous claims wherein the potential 25 interference relationship is determined in response to a measurement of a signal level in the second cell associated with a transmission in the first cell.

9. A method as claimed in any previous claim wherein the potential interference relationship is associated with assignment of co-channel carriers 30 in the first and the second cell.

10. A method as claimed in any previous claim wherein the potential interference relationship is associated with assignment of adjacent channel carriers in the first and the second cell.

5 11. A method as claimed in any previous claim wherein the potential interference relationship is in response to a ratio of communication units of the second cell for which an interference from the first cell will cause a quality level below a given threshold.

10 12 A method of frequency planning for a plurality of cells in a cellular communication system, the method comprising the steps of:
determining the interference relationship for combinations of two cells of the plurality of cells in accordance with the method of any of the previous claims 1 to 11;

15 for the combinations of two cells determining a penalty associated with a corresponding frequency allocation in response to the interference relationship of that combination of two cells; and
allocating carrier frequencies to the plurality of cells in response to the penalty values.

20 13. A method of frequency planning as claimed in claim 12 wherein the frequency allocation is such that the sum of penalty values is minimised.

14. A method of frequency planning as claimed in claim 12 or 13 wherein
25 the penalty values are associated with corresponding frequency allocations of co-channel frequencies.

15. A method of frequency planning as claimed in claim 12 or 13 wherein
the penalty values are associated with the corresponding frequency allocations
30 of adjacent channel frequencies.

16. A method according to any of the previous claims wherein the cellular communication system is a GSM communication system.
17. A computer program enabling the carrying out of a method according to 5 any of the previous claims.
18. A record carrier comprising a computer program as claimed in claim 17.
19. An apparatus for determining an interference relationship between cells 10 of a cellular communication system comprising at least a first cell and a second cell; the apparatus comprising:
means for determining an interference relationship between the first cell and the second cell in response to a potential interference relationship between the first and second cell and a simultaneous occupancy of the first 15 and the second cell.